I hereby certify that this correspondence is being electronically transmitted to the USPTO on the date shown below.

Date: March 19, 2007 Signature: _____ (Quyen Nguyen)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	09/095,323
Confirmation No.:	9521
Filing Date:	June 10, 1998
Inventor(s):	Michael D. LAUFER
Title:	METHOD AND APPARATUS FOR TREATING SMOOTH MUSCLES IN THE WALLS OF BODY CONDUITS
Examiner:	D. Shay
Group Art Unit:	3739

SUPPLEMENT TO INTERVIEW REQUEST

Mail Stop AF
Commissioner for Patent
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant submits this interview request in writing to confirm that the subject application shall be in condition for allowance in view of nominal further consideration of the reference identified in a recent search conducted by the Examiner.

Applicant is submitting this request per MPEP 713.09. In view of the following, applicant believes that an interview is required and appropriate. Applicant believes that the case shall require nominal further consideration and shall be in condition for allowance as will be made clear during the interview.

Applicant also notes that the subject application was filed on June 8, 1998. In view of the numerous Office Actions, and the previous indication that the claims would be in condition for allowance subject to the performance of an additional search, applicant believes that this interview is required. As noted below, the search identified Shesterina, M. V. [Effects of Laser Therapy on Immunity in Patients with Bronchial Asthma and Pulmonary Tuberculosis] Probl Tuberk. 1994; 5: 23-26. However, this reference fails to anticipate or render applicant's claims.

Applicant requests the interview to expedite the review of the Shesterina reference (applicant is attaching a translation herewith) and to discuss how this reference fails to anticipate the pending claims or render the pending claims unpatentable.

The content of the interview shall focus on the patentabilty of the claims over Shesterina. Namely that Shesterina teaches use of endobronchial laser phototherapy to eliminate inflammatory changes in the bronchi and the effect of such phototherapy on the immune status of the patient. Shesterina also teaches the use of a reflex-therapy method of treating bronchial asthma using laser puncture at various acupuncture points.

Clearly, applicants claims relate to methods of treating asthma by irradiating walls of an airway at a wavelength and intensity which over time causes debulking of tissue in the lungs (claim 50) or mucus gland cells (claim 33).

As background, the Patent Office issued a Final Office Action for the present case on June 12, 2006. Applicant conducted telephone interviews with the Examiner on September 6, and September 13, 2006. In response to the interviews, as noted by the Interview

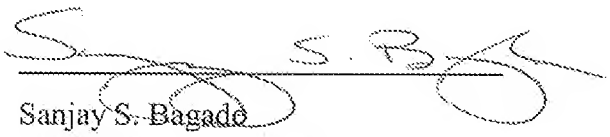
Summary Dated September 22, 2006, the parties reached an agreement with respect to amendments that would overcome the references cited in the Final Office Action. The Interview Summary noted that the Examiner would perform an additional search and enter the amendments for allowance of the claims if no new art was found.

During a telephone call of November 28, 2006, the Examiner noted that two references were found: 1) Vasilotta A., I. R. Laser: a New Therapy in Rhino-sino-nasal Bronchial Syndrome with Asthmatic Component., Proc X. Internat Congr Soc Lasers in Surgery and Medicine, Bangkok 1993, p. 161; and 2) Shesterina, M. V. [Effects of Laser Therapy on Immunity in Patients with Bronchial Asthma and Pulmonary Tuberculosis] Probl Tuberk. 1994; 5: 23-26.

In a further telephone call the Examiner indicated that Shesterina was the only relevant reference under the search.

As noted above, Shesterina fails to anticipate the claims. Applicant belives that only nominal further consideration of Shesterina is required and shall result in the allowance of the subject claims.

Respectfully submitted,



Sanjay S. Bagade
Registration No. 42,280

Customer No. 40518
Levine Bagade LLP
2483 East Bayshore Road, Suite 100
Palo Alto, CA 94303
Direct: (650) 242-4212
Fax: (650) 284-2180

Attachment: TRANSLATION OF Shesterina, M. V. [Effects of Laser Therapy on Immunity in Patients with Bronchial Asthma and Pulmonary Tuberculosis] Probl Tuberk. 1994; 5: 23-26

UDC 616.248-022.7-06:616.24-002.5]-02:615.849.19

M. V. SHESTERINA, R. P. SELITSKAYA, L. P. PUTILINA, AND YU. YU. PONOMAREVA
Moscow Scientific Research Institute of Tuberculosis
of the Russian Federation Ministry of Health and Medical Industry

EFFECT OF LASER THERAPY ON IMMUNITY IN PATIENTS WITH BRONCHIAL ASTHMA AND PULMONARY TUBERCULOSIS

Source: Unavailable, No. 4, publication date unavailable, pp. 23–26
Submitted October 27, 1993

In recent years physical methods of treatment, including laser therapy, have become more and more common in phthisiopulmonological practice. The need to analyze the mechanisms of implementation of the positive effect of these kinds of therapy accounts for the pressing nature of the problem.

Immune protection and its restoration as a result of therapeutic measures are of great importance in maintaining homeostatis, in correcting pathogenetic mechanisms of disease, and in optimal correction of structural and functional disturbances of the organ.

Our work investigated the possible effect of laser radiation, which also is applied endobronchially to acupuncture points, on the immune status of bronchial-asthma (BA) patients and on individuals with a combination of BA and pulmonary tuberculosis.

We evaluated immunity indices before and after treatment of 59 patients with BA combined with tuberculosis (36 women and 23 men) 18–70 years old. Clinical, laboratory, bronchologic, x-ray, and functional studies were conducted in different stages of treatment. The results underwent statistical processing.

The patient-observation period was from 6 months to 3 years, which enabled us to evaluate the condition of patients in different stages of treatment of the disease. All patients were diagnosed with an infection-dependent clinical–pathogenetic variant of BA or a mixed variant with the latter prevalent; the severity of the BA was mild or moderately severe, the phase was the acute ("exacerbation") phase, and the length of illness was 1–15 years.

The infiltrative form (54.5%) predominated in the breakdown of the forms of pulmonary tuberculosis in patients with combined pathology, while

the focal form was present less often, and still other occurred forms in individual cases. In an overwhelming majority of cases pulmonary tuberculosis was diagnosed for the first time. By the time of diagnosis of pulmonary tuberculosis, 70% of the patients had suffered from BA for more than 5 years. In 60% of cases antituberculous therapy lasting 2–6 months that was started at the place of residence could not be considered efficacious by clinical x-ray criteria.

The key attribute by which the patients were grouped prior to treatment was the nosologic form. There were 30 patients with BA, 12 with BA and inactive tuberculosis (IT), and 17 with active tuberculosis (AT). Following treatment, the patients were grouped not only with consideration for clinical form but also in relation to the mode of treatment (the main groups received laser radiation in complex therapy, while control groups did not). Inasmuch as the immunity indices in the different stages of observation were similar in patients with BA and in those with BA with IT, we deemed it possible to join these patients into a single observation group after treatment: the main first group (24 patients) and control third group (18), and the main second group (10 patients) and control fourth group (7) were made up of patients suffering from BA and AT.

All patients received basic medicamentous BA therapy, including administration of bronchodilators (selective sympathomimetics, cholinolytics, methylxanthines), antihistamines, calcium antagonists, mucolytic agents, expectorants, mast-cell membrane stabilizers, glucocorticosteroidal hormones as indicated, mainly in the form of dosed aerosols with high local activity and mild systemic effect, and, in rare cases and on the basis of strict indications, antibiotics. Therapeutic physical culture and chest massage were included as needed in the set of therapeutic measures.

Most patients with BA combined with AT received specific therapy consisting of three antituberculous drugs. Mainly isoniazid, streptomycin, rifampicin, and ethambutol were used. All patients with IT were prescribed isoniazid intermittently 3 times a week to prevent reactivation of the specific process.

In combined treatment of BA in the main patient groups (groups 1 and 2), laser therapy was used with endobronchial irradiation with a helium–neon laser (HNL) or a CO_2 laser and HNL laser-puncture.

In BA patients with catarrhal endobronchitis we used endobronchial laser phototherapy by the methods developed for this pathology [2, 4, 5]. For endobronchial irradiation we used an LG-111 HNL with a 0.63-μm wavelength, with a guide diameter of 0.1 cm and 15 mW of power at the end

of the guide. HNL radiation was delivered via a quartz guide that was led in to the inflamed bronchial mucosa through the channel of a fiber-optic bronchoscope or the tube of a rigid bronchoscope. Exposure to laser irradiation was 5 min to the bronchi of one lung; the total one-time dose of laser energy was 9 J — 4.5 J to the bronchi of each lung. The procedure of endobronchial HNL irradiation of the mucosa was performed twice a week, and the number of irradiations, which amounted to four or five procedures, was determined by the attainment of clinical curing of the endobronchitis.

Endobronchial treatment of suppurative endobronchitis was performed with a CO_2 laser with a 10.6-μm wavelength and a power density of 3.6 W/cm [*sic*] in the exposure zone; this was accomplished by defocusing and deadjusting the laser beam. We used an experimental Skal'pel'-3 laser setup with an attachment for endobronchial laser irradiation. Exposure to laser irradiation was 40–60 s of net laser time on the bronchi of one lung. The laser-therapy procedure was performed once a week, in a course of three or four sessions, until endoscopic determination was made that the suppurative bronchitis had been cured.

We included endobronchial laser phototherapy in the set of treatment measures mainly to eliminate inflammatory changes in the bronchi; we also took into account its multifactor positive effect on the body.

We used a reflex-therapy method of treating the pathology — laser-puncture — to act on the component of disruption of bronchial patency in BA known as spasm of the smooth musculature of the bronchi. Laser-puncture was performed simultaneously or by turns with endobronchial laser applications following the methods and principles of reflex therapy. We used an LG-111 HNL with 15 mW of power at the end of the guide and a 20-s exposure per corporeal acupuncture point; the course lasted 10–12 sessions daily or every other day. In one laser-puncture session we used no more than five or six acupuncture points positioned symmetrically (except those located on the anterior and posterior central meridians).

The acupuncture points chosen for a session were tailored with consideration for the pathogenetic mechanisms of BA, by the method of E. D. Tykochinskaya [3] and G. Luvsan [1]. We generally used one or two acupuncture points with general reflexive action, two with reflexosegmental action, and one or two with regional action. In patients with combined pathology who are undergoing a long fixed treatment stage, short courses (of five to seven procedures each) administered to points of general and segmental action were performed to prevent spring–fall recurrences. On a

day of diagnostic or therapeutic bronchoscopy, a laser-puncture session would be canceled.

Immune status was evaluated by the percentage of the T-mature population of lymphoid elements (Tl) and of regulatory subpopulations — T-helpers (Th) and T-suppressors (Ts) and B lymphocytes (Bl) in the peripheral blood. Bl activity was characterized by the level of immunoglobulins — IgM, IgG, and IgA.

The content of these immunoglobulins was determined by radial immunodiffusion after Mancini, and the breakdown by population and subpopulation was determined by immunofluorescence of monoclonal antibodies.

The changes in the patient indices studied are presented in the table.

Immunity Indices of Patients With BA Combined With Tuberculosis ($M \pm m$)

Index	Nosologic group				
	BA (1)	BA + IT (2)	p_{1-2}	BA + AT (3)	p_{1-3}
Tl	38.2 ± 1.24	36.7 ± 1.33	>0.05	29.5 ± 1.36	<0.05
Th	36.1 ± 1.61	35.0 ± 1.40	>0.05	32.8 ± 2.20	>0.05
Ts	17.0 ± 1.32	16.1 ± 1.28	>0.05	14.7 ± 1.50	>0.05
Bl	16.6 ± 1.58	16.2 ± 1.62	>0.05	18.0 ± 1.60	>0.05
IgM	3.24 ± 0.51	3.95 ± 0.44	>0.05	4.35 ± 0.56	<0.05
IgG	17.4 ± 0.71	17.9 ± 0.45	>0.05	24.5 ± 1.20	<0.05
IgA	2.01 ± 0.28	2.54 ± 0.37	>0.05	3.68 ± 0.48	<0.05

In BA patients significant changes in immune status were found compared with essentially healthy individuals. These changes were evidenced in a significant decrease in the Tl population (38.2 ± 1.24 and 66.9 ± 2.4%, respectively) and the Ts subpopulation (17.0 ± 1.32 and 28.0 ± 2.0%, respectively), and an increase in the Bl level (16.6 ± 1.58 and 7.3 ± 1.5%, respectively) and in polyclonal gamma-globulinemia. In BA patients the Th subpopulation differed insignificantly from that of essentially health individuals (36.1 ± 1.61 and 38.9 ± 1.5%, respectively). The decrease in the Ts level led to an increase in the immunoregulatory index (the ratio Th/Ts).

Previous tuberculosis did not significantly affect immune-status indices in BA patients — we did not find significant differences in immune-status indices in BA and IT patients. Immune-status indices were most changed in

BA and IT patients.* A significant decrease in the Tl population (29.5 ± 1.36%) compared with BA patients ($p < 0.01$) and in the Ts population (13.7 ± 1.5%) and an increase in Bl level (18.0 ± 1.6%) were found. In this category of patients the immunoglobulin levels were significantly higher than in BA and in BA combined with IT.

Thus, we have established that BA patients experience significant changes in immune status; intrathoracic IT or traces of a previous tuberculosis process in the lungs did not affect the nature of these changes. When BA is combined with AT, the changes that we found are of the same character as with BA alone, but the degree to which they are expressed is significantly greater.

We also reexamined immune status after the completion of a laser-therapy course (after 1.5–2 months) at the same times in the control groups, where traditional therapy was administered.

Analysis of the dynamics of the indices studied revealed the dependence of the results on not only the nosologic form but also the kind of therapy (figs. 1 and 2). For instance, in all four groups examined (group 1 — BA patients after laser phototherapy, group 2 — BA and AT patients after laser phototherapy, group 3 — BA patients after traditional therapy, and group 4 — BA and AT patients after traditional therapy) the Tl count and the T-lymphocyte subpopulations increased, leading to normalization of the immunoregulatory index, but these changes were significant only in the experimental groups (with laser phototherapy). A further increase in IgM level and a decrease in IgG level were found in the experimental groups after treatment; these changes were significant in group 1 ($p < 0.05$), but insignificant in group 2 and the control groups.

The data obtained attest to the immunomodulatory effect of laser radiation, which is evidenced firstly in the increase in some indices of the immunity T-system: the Tl population and T-subpopulations, a deficiency in which is noted both in BA and, to a greater extent, when BA is combined with tuberculosis; and secondly, in some inhibition of the immunity B-system, which probably is a consequence of the regulatory action of stimulated populations of T-lymphocytes. The most pronounced normalizing effect of laser therapy with respect to immune-status indices that was observed in BA patients correlated with the clinical picture assessed by the criteria used in pulmonology for BA.

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* Translator's note: Sic; this sentence appears to be inconsistent with the second clause of the preceding sentence.

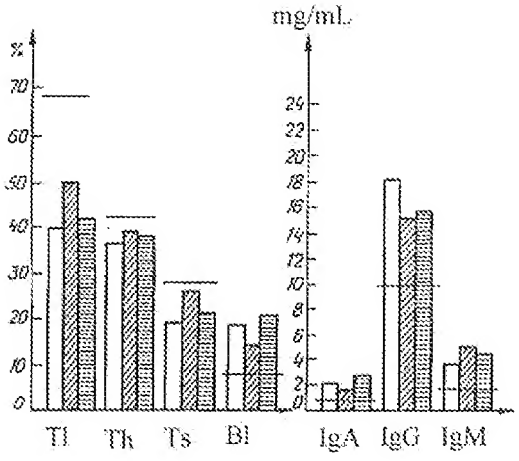

Fig. 1. Changes in immunity indices in BA patients in the course of traditional therapy and with laser phototherapy. Solid line — immunity indices of essentially healthy individuals; light columns — for BA patients prior to treatment; obliquely hatched columns — for BA patients after laser phototherapy; columns with horizontal hatching — for BA patients after traditional therapy.

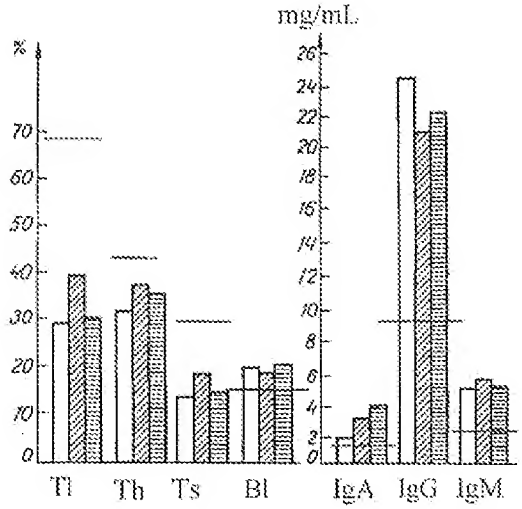

Fig. 2. Changes in immunity indices of patients with BA combined with AT in the course of traditional therapy and with laser phototherapy. Solid line — immunity indices of essentially healthy individuals; light columns — for BA/AT patients prior to treatment; obliquely hatched columns — for BA/AT patients after laser phototherapy; columns with horizontal hatching — for BA/AT patients after traditional therapy.

References

1. G. Luvsan, *Traditional and Modern Aspects of Eastern Reflex Therapy* [in Russian], Moscow, 1990.
2. A. A. Priimak and A. A. Khaitun, *Problemy tuberkulyoza*, No. 1, 1990, pp. 10–12.
3. E. D. Tykochinskaya, *Foundations of Reflex Therapy*, Moscow, 1979.
4. M. V. Shesterina, B. M. Maliyev, A. A. Khaitun, *et al.*, *Use of Lasers in Surgery and Medicine. International Symposium* [in Russian], Moscow, 1988, Part 1, pp. 337–339.
5. M. V. Shesterina and M. G. Biron, *Problemy tuberkulyoza*, No. 7, 1989, pp. 17–20.